#11 Appeal Brief 9-15-99 L Butler

Docket No. **WAA-167**

IN THE UNITED STATES PATENT OFFICE

Applicants: **LEVEILLE, Michael** Examiner: **Philip Tucker**

Serial No.: **08/834,061** Art Unit:

Filed: **04/11/97** Examining Group: **2200**

Titled: **CALIBRATION MEDIUM FOR WAVELENGTH CALIBRATION OF U. V. ABSORBANCE DETECTORS AND METHODS FOR CALIBRATION**

Assistant Commissioner for Patents
Box AF
Washington, D.C. 20231

Dear Sir:

BRIEF ON APPEAL

This Brief on Appeal is submitted pursuant to the Notice of Appeal, mailed on **04/01/99** from the Examiner's final rejection of claims **2-15, and 37,** mailed **12/02/98** in the above-referenced patent application.

Each of the requirements set forth in 37 C.F.R. 1.192(c) follow under the separate headings.

I. Real Party of Interest

The real party of interest in the above identified application is Waters Investments, LTD, as assignee of the above application; and Waters Corporation, the parent corporation of the assignee. Waters Corporation is a publicly traded corporation.

II. Related Appeals And Interferences

There are no appeals or interferences which relate to the above identified application or the present appeal.

III. Status Of The Claims

Claims 2-15, 17-20 and 34-39 are pending in the present application. In the final office action (bearing a mailing date of December 2, 1998,) claims 17-20 and 38-39 were allowed. Claims 2-15 and 34-37 were rejected. Rejections of claims 34-36 were due to minor problems under 35 USC Section 112. After final rejection, Applicant introduced an amendment which the Examiner entered upon Applicant filing the present appeal.

The advisory action identifies the allowed claims as claims 17-20 and 34-39, and the rejected claims as claims 2-15. Applicant respectfully submits this designation of

claims is in error. The Examiner, as confirmed by a telephone conversation between the Examiner and Attorney for Applicant on May 28, 1999, his intention to indicate that the allowed claims are claims 17-20, 34-36, and 38-39. The Examiner intended to maintain rejections of claims 2-15 and 37. Applicant's notice of appeal designated an appeal of claims 2-15 in accordance with the advisory action. Applicant's notice should have designated claims 2-15 and 37.

Applicant respectfully requests that this Honorable Board consider Applicant's Appeal as to claim 37. The omission of claim 37 was inadvertent and related to the error in the advisory action. The Examiner has raised no objection to Applicant's request, and has agreed that it is proper for Applicant to introduce arguments as to claim 37.

IV. Status of Amendments

Applicant submitted one amendment after final. Applicant's amendment was intended to address minor issues regarding 35 USC Section 112. Upon filing of the appeal, the Examiner noted that such amendment would be entered and Applicant assumes this is so. There are no issues under appeal with respect to 35 USC Section 112.

V. Summary of the Invention

The claims that are the subject of appeal are directed to a calibration medium. An optical calibration medium is an article of manufacture having selected identifiable optical qualities. These identifiable qualities can serve as a control, or reference point to which an instrument may be adjusted. The claims of the present application can be divided into three groups. A first group of claims is directed to an instrument with a calibration medium. A second group of claims is directed to a method of using the calibration medium. A third group of claims is directed to a calibration medium. The first two groups of claims have been allowed. The third group of claims and only these claims, are the subject of the present appeal.

The rejected claims recite a calibration medium for an optical instrument, which optical instrument has a spectral light source. The light source is capable of emitting light in the far UV range which light travels along a light path and which light comprises at least one wavelength. The optical instrument further comprises means for receiving a sample within said light path, and a sensor assembly for receiving light and producing a signal. The sensor assembly produces a signal upon receiving light having the wavelength. The calibration medium comprises a sol-gel glass monolith. The sol-gel glass monolith is capable of assuming a position within the light path. The sol-gel glass monolith has a rare-earth dopant therein the constituents of the sol-gel glass monolith constituents comprising selected so the rare-earth doped sol-gel glass monolith exhibits a transmittance in the far UV range so at least one spectral feature of the rare-earth dopant in the far UV range is discernable and corresponds to a control value to allow the sensor assembly receiving light having a wavelength corresponding to the control value to be calibrated.

VI. Issues

The present appeal raises issues under 35 USC Sections 103 and 103. The issues on appeal are described below.

With respect to rejection under 35 USC Section 102:

Whether claims, drawn to an article of manufacture, for use in a particular apparatus or device environment, are anticipated by Orignac et al, Applied Physics Lett, vol 69, no 7, pages 895-897 (Orignac), which prior art does not teach, disclose or suggest such apparatus, and which prior art does not teach, disclose or suggest the selection of dopants to produce spectral features which cooperate with spectral features of the light source and sensor means.

Whether claims, drawn to an article of manufacture, for use in a particular apparatus or device environment, are anticipated by Xu et al, Journal of Non-Crystalline Solids, vol. 194, pages 235-240, (1996) (Xu), which prior art does not teach, disclose or suggest such apparatus, and which prior art does not teach, disclose or suggest the selection of dopants to produce spectral features which cooperate with spectral features of the light source and sensor means.

Whether features of dependant claims as to spectral ranges, concentrations of dopants, and range of transmittance, which features are not taught, disclosed or suggested in the references of record, are anticipated by such references, Orignac or Xu.

With respect to rejections under 35 USC Section 103:

Whether the rejections based on Orignac and Xu are made in accordance with the mandates of Graham v. Deere, 383 US 1 (1966), where the prior art does not teach, disclose or suggest the selection of dopants to produce spectral features which cooperate with spectral features of the light source and sensor means, and do not suggest any need for doping by impregnation.

VII. Grouping Of The Claims

For the purpose of this appeal only Applicant makes the following grouping of claims. With respect to the rejections, as being anticipated under 35 USC Section 102(e) by Orignac, Applicant will argue Claims 2-15 and 37 as a single group with separate arguments being directed to the subject matter of dependant claims 3, 5, 7 and 8.

With respect to the rejections, as being anticipated under 35 USC Section 102(b) by Xu, Applicant will argue Claims 2-4, 6, 7, 9-15, and 37 as a single group with separate arguments directed to the subject matter of dependant claims 3 and 7.

With respect to rejections under 35 USC Section 103 (a), as being obvious over Orignac and Xu, Applicant will argue claims 10, 12 and 37 as a single group.

VIII. Appellants' Arguments

A. Claims 2-15 and 37 are not anticipated by Orignac

The Examiner has rejected claims 2-15 and 37 under 35 USC Section 102(e) as being anticipated by Orignac. The Examiner contends Orignac teaches a waveguide which comprises an Nd or Er doped sol-gel medium, wherein Erbium nitrate is the Er salt. The Examiner contends the waveguide has light input means and means for measuring the spectral output of light. The Examiner contends that the Applicant's intended use does not distinguish the invention from Orignac.

1. Applicant's characterization of the Orignac reference is unchallenged.

Applicant's characterization of the Orignac reference has not been challenged. Although Orignac, may have investigated the spectral properties of sol-gel glass monoliths, Orignac had no appreciation that sol-gel glass monoliths had applications as a calibration medium. The sol-gel monoliths did not cooperate with the sensor or with light input means to set a value for calibration. And, the sol-gel glass monoliths studied by Orignac would not necessarily been suitable as a calibration medium. Orignac did not select the rare earth dopants of the sol-gel glass monoliths to provide transmittance in the far UV range of the light source such that the spectral features would be discernable by the sensor.

This feature is expressly recited in the present claims and is not disclosed in any manner in the references of record. This feature allows the sol-gel glass monolith to serve as a calibration medium, whereas the materials of the prior art may not. This feature is not an intended use. It is a physical chemical characteristic of the monolith.

2. The rejection does not conform to the claim language.

Claim 37 is directed to the calibration medium of the present invention. Claim 37 recites cooperation between the light source, sensor assembly and the sol-gel. That is, the sol-gel must have at least one spectral feature which corresponds to a spectral feature of the light source to allow calibration. Further, the sensor must be able to detect the spectral feature of the light source and the sol-gel monolith. This feature is not an intended use, as the Examiner contends, but rather, a special feature engineered into the sol-gel monolith based the light source and the sensor.

The rejections do not conform to the language of the claims. The Examiner has been forced to simplify the claim elements, totally discarding features of various element of the claims, in order to force a rejection.

Did Orignac teach, disclose, or suggest any calibration media in their work? The answer is no.

Did Orignac teach, disclose or suggest selecting the rare earth dopants of the sol-gel glass monoliths, which they were studying, to provide transmittance in the far UV range of the light source such that the spectral features would be discernable by the sensor? The answer is no. Orignac was apparently most interested in communications applications in which it may be undesirable to discern the spectral features.

3. The Concentrations of Dopants is Different

Orignac did not teach, disclose or suggest selecting the concentration and elements of the rare earth dopants for cooperation between the light source and sensor assembly. The concentrations of rare earth dopants, to effect such cooperation are not the same concentrations used by Orignac. In order for the spectral feature to be apparent and detectable by the sensor at the light intensity produced by the light source, the rare earth dopants must have a concentration many times that found in the materials disclosed in Orignac.

The rejection comprises an inventory of parts and a broad statement that new uses of old materials are not novel. There is no explanation as to how such parts interact. The rejection does not address Applicant's arguments that such rare earth dopants are selected to provide spectral features discernable by the sensor at the light intensity of the light source.

Applicant respectfully submits the Examiner's rejections under 35 USC Section 102 with respect to claims 2-15 and 37 in view of the Orignac reference warrant reversal.

4. Dependent claims are novel over Orignac.

The rejections fail to address features of claims 3, 5, 7 and 8 with respect to Orignac. There is no mention in the Orignac reference of spectral features in the 200 – 300 nm range. There is no mention in the Orignac reference of fifty percent transmittance in the UV range. There is no mention in the Orignac reference of a concentration of dopants in the 6 to 10% range. These features are recited in claims 3, 5, 7 and 8. And, such claims are not anticipated by the Orignac reference.

The claim language does not recite a use, but recite a particular physical chemical property or concentration. The rejections fail to point out where the reference discloses such features. Indeed, the reference does not disclose such features. The Examiner's broad rejection, that new uses of old materials are not novel, is not on point.

The dependant claims do not merely recite a use or purpose. Applicant's cogent arguments in this regard have not been addressed. And, the present rejections under 35 USC Section 102 based on Orignac warrant reversal.

B. Claims 2-4, 6, 7, 9-15 and 37 are not anticipated by Xu

The Examiner has rejected claims 2-4, 6, 7, 9-15 and 37 under 35 USC Section 102(b) as being anticipated by Xu. The Examiner contends Xu teaches an optical device which utilizes a doped sol-gel comprising Erbium nitrate. The Examiner contends the device has light input means and means for measuring the spectral output of light. The Examiner contends that the Applicant's intended use does not distinguish the invention from Xu.

1. Applicant's characterization of the Xu reference is unchallenged.

Applicant's characterization of the Xu reference has not been challenged. Although Xu, like Orignac, may have investigated the spectral properties of sol-gel glass monoliths, Xu had no appreciation that sol-gel glass monoliths had applications as a calibration medium. The sol-gel monoliths did not cooperate with the sensor or with light input means to set a value for calibration. And, the sol-gel glass monoliths studied by Xu, like those of Orignac, would not necessarily been suitable as a calibration medium. Xu did not select the rare earth dopants of the sol-gel glass monoliths to provide transmittance in the far UV range of the light source such that the spectral features would be discernable by the sensor.

This feature is expressly recited in the present claims and is not disclosed in any manner in the references of record. This feature allows the sol-gel glass monolith to serve as a calibration medium, whereas the materials of the prior art may not. This feature is not an intended use. It is a physical chemical characteristic of the monolith the present invention. The Examiner has not introduced any argument that this is not a physical chemical feature of the monolith of the present invention. Nor has the Examiner pointed to any part of Xu which teaches a monolith with these features.

2. The rejection does not conform to the claim language.

Claim 37 is directed to the calibration medium of the present invention. Claim 37 recites cooperation between the light source, sensor assembly and the sol-gel. That is, the sol-gel must have at least one spectral feature which corresponds to a spectral feature of the light source to allow calibration. Further, the sensor must be able to detect the spectral feature of the light source and the sol-gel monolith. This feature is not an intended use, as the Examiner contends, but rather, a special feature engineered into the sol-gel monolith based the light source and the sensor.

The rejections do not conform to the language of the claims. The Examiner has been forced to simplify the claim elements, totally discarding features of various element of the claims, in order to force a rejection.

Did Xu teach, disclose, or suggest any calibration media in their work? The answer is no.

Did Xu teach, disclose or suggest selecting the rare earth dopants of the sol-gel glass monoliths, which they were studying, to provide transmittance in the far UV range

of the light source such that the spectral features would be discernable by the sensor? The answer is no. Xu, like Orignac, was apparently most interested in communications applications in which it may be undesirable to discern the spectral features.

3. The Concentrations of Dopants is Different

Xu did not teach, disclose or suggest selecting the concentration and elements of the rare earth dopants for cooperation between the light source and sensor assembly. The concentrations of rare earth dopants, to effect such cooperation are not the same concentrations used by Xu. In order for the spectral feature to be apparent and detectable by the sensor at the light intensity produced by the light source, the rare earth dopants must have a concentration many times that found in the materials disclosed in Xu.

The rejection comprises an inventory of parts and a broad statement that new uses of old materials are not novel. There is no explanation as to how such parts interact. The rejection does not address Applicant's arguments that such rare earth dopants are selected to provide spectral features discernable by the sensor at the light intensity of the light source. The rejections fail to account for physical differences in the monoliths with respect to spectral features.

4. Dependent claims are novel over Xu.

Further, the rejections fail to explain features of claims 3 and 7 with respect to Xu. There is no mention in the Xu reference of spectral features in the 200 –300 nm range. There is no mention in the Xu reference of fifty percent transmittance in the UV range. These features are recited in claims 3 and 7.

The claim language does not recite a use, but recite a particular physical chemical property or concentration. The rejections fail to point out where the reference discloses such features. Indeed, the reference does not disclose such features. The Examiner's broad rejection, that new uses of old materials are not novel, is not on point. The claims are not anticipated by the Xu reference.

Applicant respectfully submit the Examiner's rejections under 35 USC Section 102 with respect to claims 2-4, 6, 7, 9-15 and 37 in view of the Xu reference.

3. The Examiner has misapplied the law with respect to novelty.

The Examiner states that "Applicant's intended use as a calibration medium does not distinguish." And, the Examiner states that the cases, cited in the advisory action and the final rejection state, the current state of the law. This may be so; however, it does not necessarily suggest that such law is being applied correctly in the present case. These cases state the general rule that a recited new use for a composition, in and of itself, does not convey novelty for such old composition. The cases cited by the Examiner, In re

Pearson, 181 USPQ 641, and In re Zierden, 162 USPQ 102 are directed to compositions. The present invention is directed, not to a composition, but to an article of manufacture.

And, the Zierden case itself does not address the issue of novelty other than dicta. The Zeirden case relates to questions of obviousness of new uses of old compositions. The Zierden case holds that questions of obviousness of new processes for old compositions must be determined on the basis of whether such new use is analogous or cognate to prior uses of similar material. The Examiner has not produced a single reference to suggest a cognate or analogous use. Thus, it can not be seen how the Zierden case can even be applied to the present facts.

The cases hold that compositions are not novel where only a new use has been discovered. These cases are not on point where Applicants claims are not directed to a composition. The claims read "[a] calibration medium"; the claims do not recite "a composition".

These cases are not on point where Applicant has pointed to features of the invention which comprise significant changes over the prior art compositions. The Examiner can not cavalierly dismiss such distinguishing features by characterizing the invention as a composition. A close examination of the advisory opinion and the final office action do not reveal even the slightest recognition of language directed to differences between the prior art compositions and the article of manufacture designed to be received in an optical instrument and cooperate with light emitting means, and sensors.

The Examiner is relying on the rule that no product patent may issue for the discovery of a new use for an old product or process. Such rule is tempered by the "doctrine of slight changes". Donald Chisum, Chisum on Patents, Matthew Bender, Section 1.03[8] (1997). Chisum states the doctrine as follows:

> If the old product or process must be altered (however slightly) to fit the new use discovered by the inventor, then there is no novelty bar to a patent on the product or process as altered. The structure of the old product may be very close to that of the altered product--so close that it would be normally held to anticipate if the difference in use were not considered. Nevertheless, the difference in use will suffice to distinguish the products and prevent anticipation.

Applicant has noted, not a slight difference, but a significant difference. This feature, that such rare earth dopants are selected to provide spectral features discernable by the sensor at the light intensity of the light source, is more than a slight difference. The claims also recite that the monolith is received in the optical instrument and cooperates with light emitting means and sensors. The claims recite that instrument is calibrated with respect to the selected spectral property. The Examiner has been silent in addressing these significant differences.

These differences are highlighted in the dependant claims. The Examiner has not addressed the specific ranges of concentrations of dopants recited in the dependant claims. These ranges are a hundred-fold higher than concentrations in the two references.

The Examiner has been silent in addressing Applicant's characterization of the law. The Examiner continues to characterize the invention as a composition.

As a matter of law, such features clearly establish novelty.

C. Rejections based on 35 USC Section 103

1. Claims 10,12 and 37 are not obvious over Orignac and Xu

Claims 10, 12 and 37 are rejected as being obvious over Orignac and Xu under 35 USC Section 103(a). The Examiner acknowledges that Xu and Orignac differ from the present invention in teaching in that doping by impregnation is not disclosed. The Examiner contends that it would be obvious to one of ordinary skill in the art to utilize impregnation instead of mixed doping in the inventions of Xu and Orignac.

Reconsideration of the present rejection in this regard is respectfully requested. The present rejection assumes that all the features of the present invention, but for impregnation of the dopant, are taught in the prior art. This assumption is not true as discussed in the preceding section.

Xu and Orignac were primarily interested in the application of dopants to effect waveguide functions to fiber optical cables for telecommunications. These materials are not used in a concentration or in a manner analogous to the concentration of the dopants or manner of use of the present invention. Particularly with respect to the dependant claims, these claims recite concentrations a hundred-fold greater than the concentrations of sol-gel studied by Orignac and Xu and used in the telecommunications industry to which their research is directed.

Courts have consistently applied four principles to obviousness determinations, in accordance with Graham v. Deere. First, the claimed invention must be considered as a whole. Second, the references must be considered as a whole and suggest the desirability and thus the obviousness of making the combination. Third, the references must be viewed without the benefit of hindsight vision afforded by the claimed invention. Lastly, "ought to be tried" is not the test by which obviousness is determined. See: Hodosh v. Locke Drug Company, Inc., 786, F. 2nd, 1136, 1143 No. 5, 229 USPQ 182, 187 No. 5, Fed. Cir., cert. denied 479 U.S. 827 (1986).

Applicant respectfully submits theExaminer's obviousness rejections are inconsistent with the principles and factual inquiries mandated by Graham v. Deere.

First, the present rejections under 35 USC Section 103 fail to view the Applicant's invention as a whole. The present rejections fail to consider the cooperation between the

dopant spectral characteristics, light source and sensor assembly as now recited in claim 37. That is, the light source must have a spectral feature which corresponds to the spectral feature of the dopant which can be detected by the sensor assembly. These features are not disclosed, taught or suggested in the prior art. These features require concentration not disclosed in the prior art.

The rejections based on 35 USC Section 103 do not address this feature but merely focus on the impregnation of the dopant. The Examiner argues that it would be obvious to utilize impregnation rather than direct mixing merely because it is known to do so. Clearly, the rejection fails to view the invention as a whole but merely focuses on a particular claim element.

Applicant respectfully submits many things are known, but are not obvious. The references must also be considered as a whole and suggest the desirability of making the combination. What problem is solved by impregnating the dopant in the sol-gel? Why should someone skilled in the art, reading Orignac and/or Xu, turn to impregnating the dopant in the sol-gel? These are questions the rejections should address, but fail to do so.

The impregnation of dopants is used to obtain high concentrations. These high concentrations were not necessarily desirable to Xu or Orignac.

The only reference which suggests impregnating a dopant to obtain the cooperation between the dopant spectral characteristics, light source and sensor assembly is the present application. However, to rely on the teaching of the present application is hindsight. Clearly, the present rejections. under 35 USC Section 103 is inconsistent with the principles and factual inquiries mandated by Graham v. Deere.

Applicant respectfully submits that all pending claims comport with 35 USC Section 103.

2. The Examiner has misapplied the law with respect to obviousness

The Examiner cites two cases with respect to the state of the law as it relates to new properties. The Examiner cites In re Tomlinson, 150 USPQ 623 and In re Dillon, 16 USPQ 2d 1897 with respect to obviousness issues. These cases are not on point. The Tomlinson case considered the patentability of processes which used the same composition in the same manner for a different objective. The present claims do not recite a process but, rather, recite an article of manufacture. The article of manufacture has features which are not purely compositional. The Examiner's position would hold that any article of manufacture reciting a composition, which composition is known, is obvious. For example, a microscope using a lense of glass is obvious in view of the glass composition even through such microscope may have special features.

In re Dillon also relates to claims that recite a composition and not an article of manufacture. And, the Court noted that where the concentration of a substance is different, such difference can support patentability of the composition. The present

claims are directed to an article of manufacture which article must cooperate with light emitting means and a sensor. These differences support patentability in accordance with Dillon. And, even if the claims were compositional in nature, which they are not, Applicant has pointed out that the concentrations of dopants in the prior art and the present invention are different. The present invention requires the presence of concentrations one hundred-fold greater than commonly employed in the telecommunications industry. This is a critical difference. One could not use the sol-gel monolith as a calibration medium unless the concentration was high enough to cooperate with light emitting means and sensors.

Applicant respectfully requests reversal of all rejections in this regard. The present claims are free of prior art.

IX Conclusion

Applicant respectfully submits that all pending claims are in condition for allowance which action is earnestly requested. Applicant respectfully requests this honorable board to reverse the Examiner's rejections based on novelty and obviousness.

Respectfully submitted,

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Date: July 1, 1999

APPENDIX
CLAIMS ON APPEAL

What is claimed is:

1. The calibration medium of claim 37, wherein the rare-earth dopant selected exhibits spectral features in the range of from about 220nm to about 700nm.

2. The calibration medium of claim 37, wherein the rare-earth dopant selected exhibits at least one distinct spectral feature in the range of from about 220nm to about 300nm.

3. The calibration medium of claim 37, wherein the rare-earth dopant comprises atoms of erbium.

4. The calibration medium of claim 37, wherein a concentration of the rare-earth dopant in the sol gel glass monolith is in the range from about 6% to about 10%.

5. The calibration medium of claim 37, wherein a concentration of the rare-earth dopant in the sol-gel glass monolith is selected so a good contrast between far UV spectral features of the dopant and background light is exhibited by the calibration medium.

6. The calibration medium of claim 37, wherein the sol-gel glass monolith exhibits a transmittance of about 50% at about 250nm.

7. The calibration medium of claim 5, wherein the sol-gel glass monolith is a gel-sol silica glass monolith.

8. The calibration medium of claim 8, wherein the rare-earth dopant is erbium nitrate.

9. The calibration medium of claim 37, wherein the rare-earth doped sol-gel glass monolith is made by mixing a slurry (sol) including silica, casting the sol into a rough final desired shape, solidifying the sol to produce a gel, aging the gel, drying the gel to remove the liquid phase, densifying the dried gel and doping at least one of the slurry or the gel with the rare-earth dopant.

10. The calibration medium of claim 10, wherein mixing includes adding the rare-earth dopant to the slurry being mixed.

11. The calibration medium of claim 10, further including impregnating the dried gel with the rare-earth dopant.

12. The calibration medium of claim 10, wherein aging, drying and densifying are performed under conditions that yield at least a type IV (porous) gel-silica base glass monolith.

13. The calibration medium of claim 10, wherein each of aging, drying and densifying are performed at a

temperature that is about 900°C or less.

14. The calibration medium of claim 10, wherein doping includes doping with a material including atoms of erbium.

15. The UV absorbance detector calibration method of claim 38,

wherein the UV absorbance detector is a monochromator type UV absorbance detector having a mechanism that selectively isolates a wavelength bandpass from a range of wavelengths emitted by the spectral light source;

wherein the calibration method further comprises the step of actuating the wavelength selection mechanism in stepwise fashion to sequentially isolate each bandpass over the range of wavelengths; and

wherein the step of establishing includes establishing a relationship between the operation of the wavelength selection mechanism and each wavelength bandpass being sensed by the detector.

16. The UV absorbance detector calibration method of claim 38,

wherein the UV absorbance detector is a spectrograph type UV absorbance detector where the sensor assembly is configured to simultaneously and separately detect radiation in a plurality of bandpasses;

wherein the step of sensing includes simultaneously and separately sensing in a plurality of bandpasses the radiation passing through the calibration medium, including radiation in the far UV region; and

wherein the step of establishing includes establishing a relationship between each of the plurality of bandpasses of the sensor assembly and each wavelength bandpass being sensed by the detector.

17. The UV absorbance detector calibration method of claim 38,

wherein the rare-earth dopant in the calibration medium being provided exhibits spectral features in the range from about 220nm to about 700nm;

wherein said step of identifying includes identifying spectral features exhibited by the calibration medium and the light source; and

wherein said step of establishing includes establishing a relationship using the identified spectral features

exhibited by the calibration medium and the light source.

18. The UV absorbance detector calibration method of claim 19,

wherein the calibration medium being provided includes atoms of erbium and exhibits at least a spectral feature at about 257nm;

wherein said step of identifying includes identifying at least the spectral feature exhibited at about 257nm; and

wherein said step of establishing includes establishing a relationship for the far UV region using the identified spectral feature at about 257nm.

19. The calibration medium of claim 39, wherein the rare-earth dopant comprises atoms of erbium.

20. The calibration medium of claim 39, wherein a concentration of the rare-earth dopant in the sol-gel glass monolith is selected so a good contrast between far UV spectral features of the dopant and background light is exhibited by the calibration medium.

21. The calibration medium of claim 39, wherein the gel-sol glass monolith exhibits a transmittance of about 50% at about 250nm.

22. A calibration medium for an optical instrument, which optical instrument has a spectral light source, said light source capable of emitting light in the far UV range which light travels along a light path and which light comprises at least one wavelength, means for receiving sample within said light path, and a sensor assembly for receiving light and producing a signal, said sensor assembly producing a signal upon receiving light having said wavelength; comprising:

a sol-gel glass monolith, said sol-gel glass monolith capable of assuming a position within said light path, said sol-gel glass monolith having a rare-earth dopant therein said constituents of the sol-gel glass monolith constituents comprising selected so the rare-earth doped sol-gel glass monolith exhibits a transmittance in the far UV range so at least one spectral feature of the rare-earth dopant in the far UV range is discernable and corresponds to a control value to allow the sensor assembly receiving light having a wavelength corresponding to the control value to be calibrated.

23. A method for calibrating an optical instrument which optical instrument has a spectral light source, said light source capable of emitting light in the far UV range which light travels along a light path and which light comprises at least one wavelength,

means for receiving sample within said light path, and a sensor assembly for receiving light and producing a signal, said sensor assembly producing a signal upon receiving light having said wavelength, the calibration method comprising the steps of:

disposing a calibration medium so as to be in said light path between the light source and the sensor assembly said light source emitting light in the UV spectral range, said calibration medium including a sol-gel glass monolith for receiving and transmitting light along said light path, said sol-gel glass monolith having constituents comprising a rare-earth dopant therein; said constituents of the sol-gel glass monolith selected so the rare-earth doped sol-gel glass monolith exhibits a transmittance in the far UV range so at least one spectral feature of the rare-earth dopant in the far UV range is discernable and corresponds to a wavelength comprising a control value to allow the signal of said sensor assembly receiving light having said wavelength corresponding to said control value to be compared to a standard for determining the calibration of said optical instrument;

sensing the light passing through the calibration medium with said sensor assembly to produce a signal; and,

comparing the signal to at least one other signal to determine the calibration of said optical instrument.

24. An optical instrument comprising:

a spectral light source, said light source capable of emitting light in the far UV range which light travels along a light path and which light comprises at least one wavelength;

means for receiving a sample within said light path;

a sensor assembly for receiving light and producing a signal, said sensor assembly producing a signal upon receiving light having said wavelength, :

a calibration medium capable of assuming a position in said light path between the light source and the sensor assembly, said calibration medium including a sol-gel glass monolith for receiving and transmitting light, said sol-gel glass monolith having constituents comprising a rare-earth dopant therein; said constituents of the sol-gel glass monolith selected so the rare-earth doped sol-gel glass monolith exhibits a transmittance in the far UV range so at least one spectral feature of the rare-earth dopant in the far UV

range is discernable and corresponds to a control value to allow the signal of said sensor assembly receiving light having said wavelength corresponding to said control value to be compared to a standard for determining the calibration of said optical instrument.